



Marvin Huberman

Emerging technologies change everything

"We live in a period of PROFOUND TRANSITION - and the changes are more radical perhaps than even those that ushered in the 'Second Industrial Revolution' of the middle of the 19th century, or the structural changes triggered by the Great Depression and the Second World War."

— Peter Drucker, *Management Challenges for the 21st Century*.

In today's society, change is occurring at an incredible pace. Our operating business environment is affected by many trends, such as e-commerce, the knowledge industry and globalization.

Yet, the primary driver causing and/or contributing to change is emerging technologies, particularly in the areas of computer technology, medicine and the Internet.

The emerging technologies

We live in an era with in vitro fertilization technology; credit cards, PayPal and other electronic payment options, even virtual currencies such as bitcoin, which permits payment to be made not through a bank or government regulator but rather directly by one entity to another; online social networking, shopping, advertising, even dispute resolution; Internet connected smart phones, smart cars, smart cards, and smart eye-glasses.

As developing technologies—especially in the areas of computers, life sciences, artificial intelligence and synthetic biology—continue to move at an exponential pace. We have:

- 3-D printers;
- Data from a Fitbit fitness monitoring device being used in a trial by a personal injury lawyer in Calgary, Alberta, as evidence of injury to his client;
- Custom-made personal mobile-assistive devices to help people with disabilities and to serve as extensions of their bodies and function as limbs and muscles;
- Bio-engineered devices and exoskeletons that show human-machine mergers.

These technologies, with their inconstancy, instability, mystery and perplexity are "game changers". They profoundly affect and challenge our lives, laws, and ethics, especially in the areas of personal privacy, human dignity,

fairness, equality, and access to the emerging technologies, and the value of human endeavour in the world of robots.

Additionally, critical questions arise as to the rights and obligations of robotic devices with artificial intelligence. We now need and will continue to require answers to these questions.

What we should do

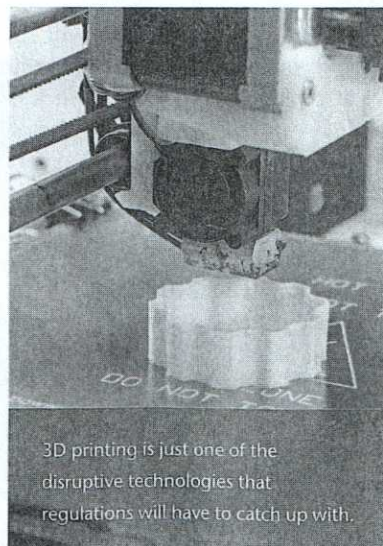
These technological innovations must be understood. The actual and potential unfair manipulation and abuse of these technologies must be properly regulated/governed by individuals, businesses, governments, legislatures, and the courts. Steps must be taken immediately to fill the ever-widening gap between the emerging technologies and our social, legal and ethical norms which cannot keep pace with technological advances.

Our digital world must be regulated proactively and reactively. A proper balance must be struck between emerging technologies and fundamental values, rights and freedoms—including privacy and protection of data—of those who use and are affected daily by these technologies.

New meaningful rules and regulations that clearly, consistently, and comprehensively address these issues must be introduced and enforced globally.

In the end, the power of emerging technologies must be harnessed and properly used, because it is the effective and appropriate application of technology that adds value to all of us—in life and in business. MM&D

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3D printing is just one of the disruptive technologies that regulations will have to catch up with.